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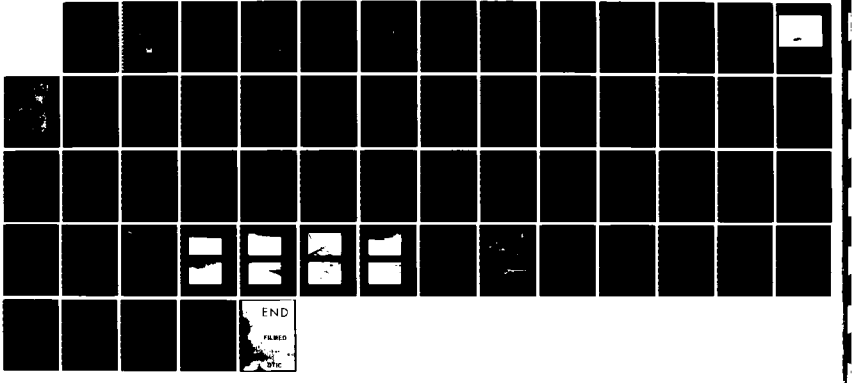

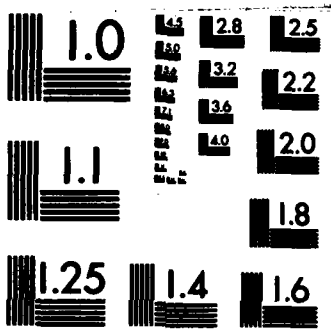

THAMES RIVER BASIN
POMFRET, CONNECTICUT

BEAUPRE'S POND DAM
CT. 00584

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
WALTHAM, MASS.

FEBRUARY 1981

UNCLASSIFIED

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Pomfret, Connecticut

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

Beaupre's Pond Dam is an earth embankment dam with an average crest width of 20 feet and irregualr but generall flat slopes. The maximum height of the dam is 12ft. and its length is 385 feet. The dam is classified as SMALL in size and a HIGH hazard structure. Based on a visual inspection at the site, the dam is considered to be in FAIR condition. The adopted test flood for this structure is equal to ½ the PMF.

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BEAUPRE'S POND DAM

CT 00584

THAMES RIVER BASIN

POMFRET, CONNECTICUT

PHASE 1 INSPECTION REPORT

NATIONAL DAM INSPECTION PROGRAM

NATIONAL DAM INSPECTION REPORT

PHASE 1 INSPECTION REPORT

IDENTIFICATION NO:	CT 00627
NAME OF DAM:	Beaupre's Pond Dam
COUNTY AND STATE:	Windham County, Connecticut
STREAM:	Lyon Brook
DATE OF INSPECTION:	3 December 1980

Brief Assessment

Beaupre's Pond Dam is an earth embankment dam with an average crest width of 20 feet and irregular but generally flat slopes. The maximum height of the dam is 12 feet and its length is 385 feet. An earth channel emergency overflow spillway is located at the left abutment and has a crest elevation of 695.5 NGVD. This spillway is a trapezoidal channel with a 24 foot bottom width and 4:1 side slopes.

Outlets for the dam consist of a 4' x 4' concrete drop inlet overflow structure which controls the level of the pond at elevation 695.0 NGVD and a 6 inch diameter cast iron low level outlet located at the bottom of the overflow structure. The outlet is a 2' x 2' concrete box culvert which carries flow to the toe of the dam. The dam has an impoundment capacity of 66 acre-feet at the top of dam elevation of 697.0 and is used for recreation.

The dam is classified as SMALL in size and a HIGH hazard structure in accordance with recommended guidelines established by the Corps of Engineers. Based on the size and hazard classifications, the adopted test flood for this structure is equal to one-half the Probable Maximum Flood (PMF) which is estimated to be 424 CFS, equivalent to 1,060 CSM from the 0.4 square mile drainage basin. This test flood has a routed outflow discharge equal to 390 CFS and would overtop the dam by 0.4 feet. The maximum outlet and spillway capacity is equal to 200 CFS which represents only 50% of the test flood outflow.

Based on a visual inspection at the site, the dam is considered to be in FAIR condition. However, these are several areas of concern which must be investigated and corrected, as required, to assure the long-term performance of this dam. It is recommended that the owner engage the services of a registered engineer experienced in the design of dams to accomplish the following:

1. Perform a detailed hydrologic/hydraulic investigation to assess further the need for and means to increase the project discharge capacity and the ability of the dam to withstand overtopping.

2. Inspect the joint at the downstream end of the original outlet conduit and the joints of the new conduit to insure that these joints are all properly sealed.

3. Supervise the replacement of the material on the downstream face in the area of the outlet with a properly selected, compacted backfill to complete the downstream slope.

These and other recommendations and remedial measures as described in Section 7 should be implemented by the owner within one year after receipt of this Phase 1 Inspection Report.

NEW ENGLAND ENGINEERING, INC.

BY: David A. Sluter
David A. Sluter, P. E.
President

This Phase 1 Inspection Report on the dam at Beaupre's Pond has been reviewed by the undersigned Review Board members. In our opinion, the reported findings, conclusions, and recommendations are consistent with the Recommended Guidelines for Safety Inspection of Dams, and with good engineering judgement and practice, and are hereby submitted for approval.

ARAMAST MAHTESIAN, MEMBER
Geotechnical Engineering Branch
Engineering Division

CARNEY M. TERZIAN, CHAIRMAN
Design Branch
Engineering Division

JOE FINEGAN, MEMBER
Water Control Branch
Engineering Division

APPROVAL RECOMMENDED:

JOE B. FRYAR, Chief,
Engineering Division

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase 1 Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, DC 20314. The purpose of a Phase 1 Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase 1 investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with the data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

Phase 1 inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test Flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonable possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aid in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition, and the downstream damage potential.

The Phase 1 Investigation does <u>not</u> include an assessment of the need for fences, gates, no-trespassing signs, repairs to existing fences and railings and other items which may be needed to minimize trespass and provide greater security for the facility and safety to the public. An evaluation of the project for compliance with OSHA rules and regulations is also excluded.

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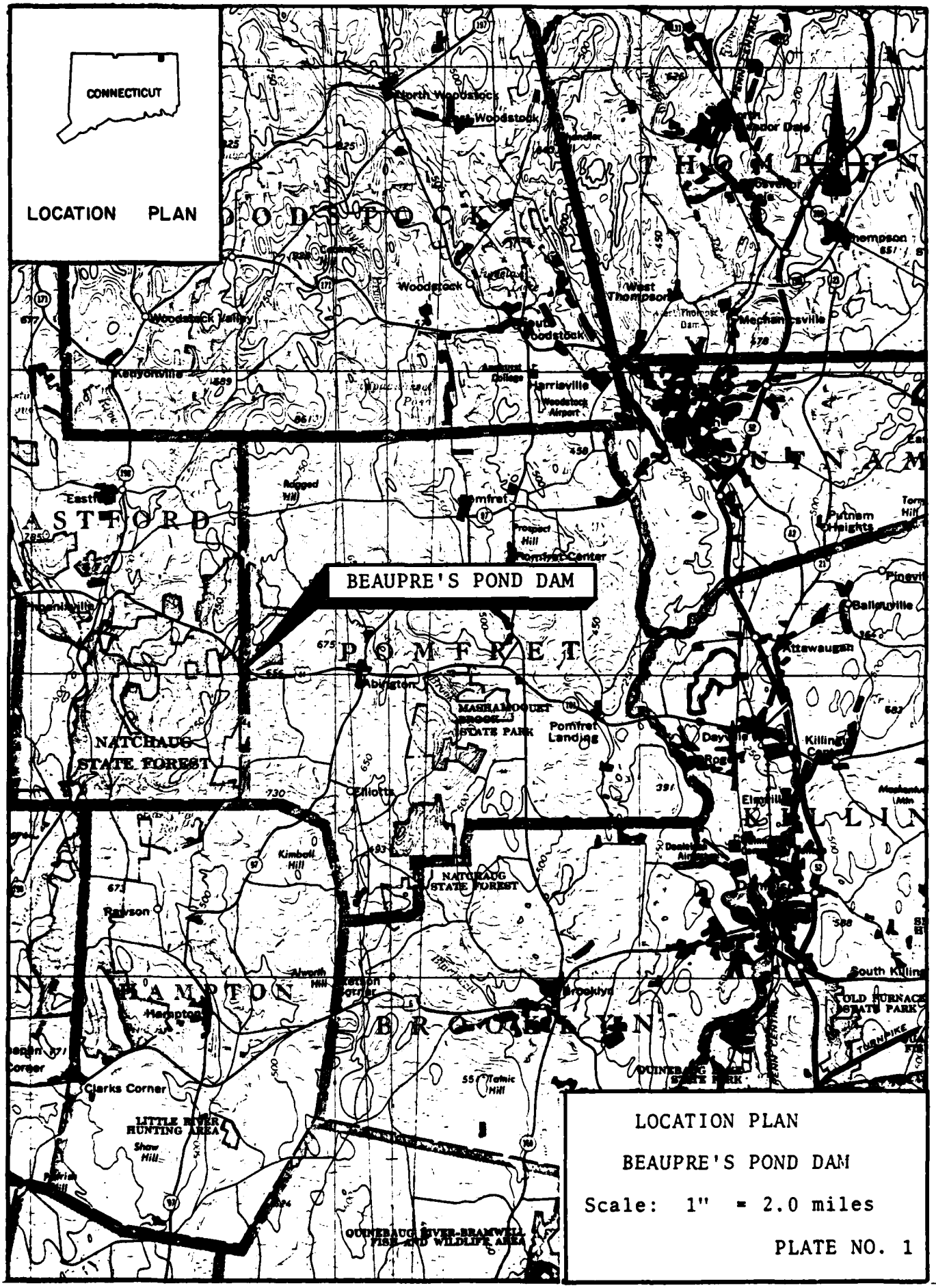
OVERVIEW PHOTO - Beaupre's Pond Dam

December 12, 1980


CONNECTICUT
LOCATION PLAN
BEAUPRE'S POND DAM
POMFRET
ASTFORD
NATCHAUG STATE FOREST
NATCHAUG STATE FOREST
LITTLE RIVER HUNTING AREA
QUINEBAUG RIVER-BRAMWELL FISH AND WILDLIFE AREA
Woodstock
North Woodstock
West Woodstock
Woodstock Valley
Kenyonville
Harrisville
Woodstock Airport
Pomfret
Pomfret Center
Prospect Hill
Ragged Hill
Abington
Pomfret Landing
MASHAMOQUET BROOK STATE PARK
Elliotts
Kimball Hill
Rawson
Hampton
Clarks Corner
Show Hill
Tatnic Hill
Brooklyn
Putnam Heights
Attawaugan
Killingly
South Killingly
COLD HURNACE STATE PARK
QUINEBAUG STATE PARK
Thompson
West Thompson
Mechanicsville
Dayville
Elmville
Danielson Airport
LOCATION PLAN
BEAUPRE'S POND DAM
Scale: 1" = 2.0 miles
PLATE NO. 1

NATIONAL DAM INSPECTION PROGRAM

PHASE 1 - INSPECTION PROGRAM

BEAUPRE'S POND DAM

SECTION 1

PROJECT INFORMATION

1.1 General

a. Authority. Public Law 92-367, August 8, 1972, authorized the Secretary of the Army through the Corps of Engineers to initiate a national program of dam inspection throughout the United States. The New England Division of the Corps of Engineers has been assigned the responsibility of supervising the inspection of dams within the New England Region. New England Engineering, Inc. has been retained by the New England Division to inspect and report on selected dams in the State of Connecticut. Authorization and notice to proceed was issued to New England Engineering, Inc. under a letter from William E. Hodgson, Jr., Colonel, Corps of Engineers. Contract No. DACW33-81-C-0007 has been assigned by the Corps of Engineers for this work.

b. Purpose of Inspection.

1. Perform technical inspection and evaluation of non-Federal dams to identify conditions which threaten the public safety and thus permit correction in a timely manner by non-Federal interests.

2. Encourage and assist the State to initiate quickly effective dam safety programs for non-Federal dams.

3. To update, verify, and complete the National Inventory of Dams.

1.2 Description of the Project

a. Location. Beaupre's Pond Dam is located in the town of Pomfret, in Windham County, Connecticut on Lyon Brook. Coordinates of the dam are approximately 41 degrees, 51.8' North Latitude, and 72 degrees, 2.6' West Longitude as shown on the Hampton, CT, USGS quadrangle sheet. The dam impounds water from Lyon Brook which drains a 0.4 square mile watershed of rolling, wooded terrain. The axis of the pond is oriented in a North-South direction with the dam at the southern end of the pond.

b. Description of the Dam and Appurtenances. Beaupre's Pond Dam is an earth embankment with a 20 foot wide crest and irregular but generally flatter than 2:1 slopes. The dam is approximately 385 feet long and the maximum height of the dam is 12 feet. At the left abutment of the dam is an earth channel emergency overflow spillway. The spillway is a trapezoidal channel with a 24 foot bottom width and 4:1 side slopes and a crest elevation of 695.5 NGVD. The outlet for the dam is a 4' x 4' drop inlet overflow structure located about 20 feet upstream from the crest at the end of a wooden dock. The low level outlet consists of a 6 inch diameter cast iron pipe and gate value located at the bottom of the drop inlet structure. The level of the pond is maintained at the crest elevation of the overflow structure which is 695.0 NGVD. Discharge is through a 2' x 2' concrete box culvert from the base of the overflow structure through the dam. The downstream end of the outlet works has been extended with 30 inch diameter concrete pipe and the transition is covered by earth fill which was placed on the downstream face to flatten the slope and fill a wet area.

c. Size Classification. Beaupre's Pond Dam has an impoundment capacity at the top of the dam (elevation 697.0) equal to 66 Ac-Ft and a maximum height of 12.0 feet. In accordance with guidelines established by the Corps of Engineers, this dam is classified as a SMALL size structure based on its impoundment capacity. Corps of Engineers guidelines specify that dams with impoundment capacities less than 1,000 Ac-Ft and greater than or equal to 50 Ac-Ft or a height of less than 40 feet and greater than or equal to 25 feet be classified as SMALL in size.

d. Hazard Classification. Beaupre's Pond Dam is classified a HIGH hazard potential because its failure could result in the loss of more than a few lives and damage to personal property in the camping area below the dam. The dam failure discharge of 2,600 CFS will cause a water depth of 4-5 feet in the campsites at the toe of the dam. There would be little to no prefailure flooding.

e. Ownership. The dam is presently owned by Mr. & Mrs. Beaupre, Beaupre's Campground, Route 44, Abington, Connecticut 06230. Phone (203) 974-1373.

f. Operator. Operation is at the direction of the owner.

g. Purpose of Dam. The dam is used for recreational activity in conjunction with the campground at the site.

h. Design and Construction History. The dam was reportedly built in the early 1950's. No construction history is available. One previous owner did report having filled

in a portion of the downstream toe area which had been swampy prior to that. He also flattened the downstream slopes by adding an unspecified amount of fill.

i. Normal Operating Procedure. The reservoir is normally unregulated and all downstream flows result from flow over the uncontrolled overflow and spillway.

1.3 Pertinent Data

a. Drainage Area. The drainage basin is oblong in shape with a length of approximately 1.3 miles, a width of 0.3 miles and a total drainage area of 0.4 square miles (See Appendix D for the basin map). Approximately 20 percent of the basin is natural storage. The topography consists of rolling terrain with elevations ranging from a high of 840 feet to 695 feet at the spillway crest.

b. Discharge at Damsite. There are no discharge records available for this dam. Calculated discharge data for the dam is listed below.

1. Outlet Works

a. Conduit & size

Overflow Structure	4' x 4' drop inlet with a 2' x 2' box culvert discharge overflow elevation = 695.0.
Low level outlet	6" diameter cast iron pipe. Invert = 686.6.

b. Discharge capacity with pond at overflow crest elevation = 695.0

Overflow structure	0 CFS
Low level outlet	3 CFS

c. Discharge capacity with pond at top of dam elevation = 697.0

Overflow structure	62 CFS
Low level outlet	3 CFS

d. Discharge capacity at test flood elevation = 697.4

Overflow structure	62 CFS
Low level outlet	3 CFS

2.	Maximum known flood at damsite	Unknown
3.	Ungated spillway capacity at top of dam	135 CFS
4.	Ungated spillway capacity at test flood elevation	200 CFS
5.	Gated spillway capacity at normal pool elevation	N/A
6.	Gated spillway capacity at test flood elevation	N/A
7.	Total spillway capacity at test flood elevation	200 CFS
8.	Total project discharge at top of dam	200 CFS
9.	Total project discharge at test flood elevation	400 CFS

c. Elevations (Datum assumed at 695.0 from USGS Quadrangle sheet for overflow structure crest)

1.	Streambed at toe of dam	685.0
2.	Bottom of cutoff	Unknown
3.	Maximum tailwater	Unknown
4.	Normal pool	695.0
5.	Full flood control pool	N/A
6.	Overflow structure crest	695.0
7.	Emergency overflow spillway crest	695.5
8.	Design surcharge (Original Design)	Unknown
9.	Top of dam	697.0
10.	Test flood	697.4

d. Reservoir Lengths (in feet)

1.	Normal pool	1,000
2.	Flood control pool	N/A

3.	Spillway crest pool	1,000
4.	Top of dam	1,000
5.	Test flood pool	1,000

e. Storage (acre-feet)

1.	Normal pool	50
2.	Flood control pool	N/A
3.	Spillway crest pool	54
4.	Top of dam	66
5.	Test flood pool	69

f. Reservoir Surface Area (Acres)

1.	Normal pool	8
2.	Flood control pool	N/A
3.	Spillway crest	8
4.	Top of dam	8
5.	Test flood pool	8

g. Dam

1.	Type	Earth embankment
2.	Length	385 feet
3.	Height	12 feet maximum
4.	Top width	20 feet
5.	Side slopes	Irregular, min. = U/S 2h:1v; D/S 3h:1v
6.	Zoning	Unknown
7.	Impervious Core	Unknown
8.	Cutoff	Unknown
9.	Grout Curtain	Unknown
10.	Other	No comment

h.	Diversion and Regulating Tunnel	N/A

i. Spillway

1.	Type	Trapezoidal earth channel. Side slopes = 4:1.
2.	Length of weir	24 feet
3.	Crest elevation	695.5 feet
4.	Gates	None
5.	U/S Channels	Natural bed of reservoir
6.	D/S Channels	Overland flow
7.	General	No formal spillway discharge channel.

j. Regulating Outlets

Low Level Outlet

1.	Invert	686.6 feet
2.	Size	6 inch diameter
3.	Description	Cast iron pipe and gate valve
4.	Control Mechanism	Gate valve
5.	Other	Common discharge with drop inlet through culvert.

SECTION 2

ENGINEERING DATA

2.1 Design

There is no available documentation regarding the design of this facility.

2.2 Construction

No formal records of construction or subsequent repairs are available for this dam.

2.3 Operation

No operational records are maintained. The level of the pond is not generally controlled.

2.4 Evaluation

a. Availability. There is no information available.

b. Adequacy. The lack of in-depth engineering data did not allow for a definitive review. Therefore, the adequacy of this dam could not be assessed from the standpoint of reviewing design and construction data, but is based primarily on visual inspection, past performance and sound engineering judgement.

c. Validity. No data is available.

SECTION 3

VISUAL INSPECTION

3.1 Findings

a. General. The Phase 1 visual inspection of Beaupre's Pond Dam was conducted on December 3, 1980, by representatives of New England Engineering, Inc. and Geotechnical Engineers, Inc. A visual checklist and photographic record of that inspection have been included in Appendix A and C, respectively, of this report. At the time of the inspection, the water level was at the overflow inlet crest height.

Based on the visual inspection, Beaupre's Pond Dam is judged to be in FAIR condition.

b. Dam. The dam is an earth embankment structure with a 20 foot wide crest and generally flat slopes (Photo C-1).

1. Upstream Face. The upstream face (Photo C-2) of the dam is generally unprotected by riprap and therefore irregular and eroded in places.

2. Crest. The crest of the dam (Photo C-5) is 18-20 feet wide, grass covered and varies in elevation by ± 4 inches. Two dock platforms extend from the crest into the pond and are used for boating and swimming purposes.

3. Downstream Face. The downstream face is also a grass covered earthen slope (Photos C-3 & C-4). The owner indicated that the dam originally had a steeper downstream slope and that fill (local bank-run gravel) was added on the downstream side to flatten the slope and widen the crest. At the same time, the outlet conduit was lengthened to increase their usable land. At the location where the conduit passes through the dam, the downstream slope is steeper than the rest of the dam (Photo C-3). This area was not filled at the same slope when additional fill was added. This area has since been partially filled with rubble and miscellaneous non-structural fill.

In spite of the rather wide crest, flat slopes, and low height of this dam, seepage through the dam does appear to be reaching the downstream slope to create zones of continual dampness. At three locations swamp grass was observed to be growing as high as half way up the downstream slope (visable as a green area in Photo C-4). No flowing water was observed at such locations.

c. Appurtenances.

1. Outlet Structure. The outlet works for this dam consists of a 4' x 4' concrete drop inlet structure located about 20 feet upstream from the crest of the dam. Normal discharge is over the top and into the drop inlet structure which is about 9 feet deep and then out through a 2' x 2' box culvert which passes through the dam. No trash rack is present on the overflow structure to prevent debris from entering the outlet. Pond drawdown is accomplished via a 6 inch cast iron pipe and gate valve near the bottom of the drop inlet structure (Photo C-7). The structure has no access to operate the gate valve. The control handle is located at the bottom of the structure, seven feet below water level. During inspection, a ladder was used to enter the overflow structure. Clear seepage of 5 to 10 gpm into the outlet structure was observed through construction joints in the concrete near the base of the overflow structure. This structure is in POOR condition.

   Clear seepage was observed exiting at a rate of 15-20 gpm from the downstream side of the outlet conduit (Photo C-8). Since this flow appeared to be greater than the seepage into the overflow structure in the pond, some seepage may be entering the conduit along its length. The conduit shown in the photo is the end of several 30 inch diameter lengths of pipe that have been added by the Owner to extend the original rectangular conduit that passes through the dam. It is not known whether the connection between the old and new conduit was sealed. Seepage may be occurring at the joint between the original conduit and the concrete pipe.

2. Emergency Overflow Spillway. A shallow earthen channel has been excavated at the left abutment of the dam to provide overflow capacity during high flows (Photo C-9). Currently, this channel is full of brush and debris and its capacity is reduced as a result. This spillway has no formal discharge channel and flood discharges flow overland to the brook downstream of the dam. No erosion downstream of the spillway was visable.

3.2 Evaluation

a. Based on the visual inspection, the following features could adversely affect the future performance of the dam and should be investigated or remedied:

1. The connection between the old and new conduit and any leakage past the old conduit should be observed directly and necessary repairs made. The

joints between the new sections of the conduit within the embankment should be sealed. The miscellaneous fill over the conduit area should be removed and replaced with appropriate compacted fill. The final slope should be the same as the rest of the dam.

2. The overflow spillway channel should be cleared of brush and debris. A downstream discharge channel should be constructed.

3. The drawdown gate valve should be made to be operable from above the overflow structure.

4. Erosion protection of the upstream shoreline is required to ensure that erosion does not progress too far into the crest.

5. The zones where swamp grass is growing should be observed periodically to determine whether seepage is developing.

SECTION 4

OPERATIONAL AND MAINTENANCE PROCEDURES

4.1 Operational Procedures

a. General. Beaupre's Pond is used by the owner as the primary recreational facility of the camp ground at the dam site. Operational control is the responsibility of the owner. The pond level is lowered every 3-4 years in the late fall to remove aquatic vegetation in the pond. Normally, the outlet structures remain closed and the water level is maintained at the crest of the overflow structure.

b. Warning System. There is no warning system in effect at Beaupre's Pond Dam. There is no formalized emergency action plan for the dam.

4.2 Maintenance Procedures

a. General. Maintenance performed on the dam consists of mowing grass on the crest and downstream slope lawn areas. The discharge channels and the emergency overflow spillway are not maintained.

b. Operating Facilities. The low level outlet valve is reported to be operated each year and is in good operating order. The valve handle should be extended to the surface, however, so that it may be operated without entering the overflow structure.

4.3 Evaluation

a. Maintenance on the embankment is sufficient for its requirements except that an area of non-structural fill material should be removed and the practice of placing such material on the embankment should be discontinued. The emergency overflow spillway should be cleared of brush and maintained periodically.

b. An emergency action plan should also be developed and implemented that includes procedures to lower the pond level locations of emergency equipment, materials or manpower to reduce or minimize dam failure damage, authorities to be contacted in emergency situations and a program of surveillance during unusual storm events.

SECTION 5

EVALUATION OF HYDRAULIC/HYDROLOGIC FEATURES

5.1 General

Beaupre's Pond Dam was constructed in the early 1950's to create a pond for recreational purposes. The dam is located on Lyon Brook which is tributary to Mashamoquet Brook and the Quinebaug River in the Thames River Basin. The watershed for the pond is 0.4 square miles with approximately 20% of that area providing natural basin storage.

The main outlet control is a 4' x 4' drop inlet overflow structure. There is also an earth channel overflow spillway to accommodate higher flows. The earth embankment dam is 385 feet in length with a maximum height of 12 feet. The pond has a storage capacity at the overflow crest of 50 Ac-Ft. Each foot of depth above the spillway level can accommodate 8 Ac-Ft of water equivalent to 0.4 inches of runoff from the watershed.

It will take approximately 1 1/2 days to lower the reservoir 1 foot based on a surface area of area of 8 acres and an outflow of 3 CFS through the 6 inch diameter low level outlet.

5.2 Design Data

Little specific data is available for this watershed or structure. In lieu of existing complete design information, U.S.G.S. topographic maps (scale 1" = 2,000 ft.) were utilized to develop hydrologic parameters such as drainage area, reservoir surface areas, basin slopes, and other runoff characteristics. Elevation-storage relationships for the reservoir were approximated. Some of the pertinent hydraulic data was obtained or confirmed by actual field measurements at the time of the visual inspection. Test flood inflows and outflows and dam failure flows were determined in accordance with the Corps of Engineers guidelines.

5.3 Experience Data

No historical data for recorded discharges is available for this dam.

5.4 Test Flood Analysis

Recommended guidelines for the Safety Inspection of Dams by the Corps of Engineers were used for selection of the Test Flood. This dam is classified under those guidelines as a HIGH hazard and SMALL in size. Guidelines indicate that

from one-half the PMF to the full PMF be used as a range of test floods for such a classification. A test flood equal to one-half the PMF was adopted for this analysis because the dam is on the low end of the size classification. The watershed has a total drainage area equal to 0.4 square miles of which approximately 20% is natural storage. This drainage area is wooded, with rolling topography.

A test value was selected from the Corps of Engineers PMF Curve for a flat to rolling watershed and reduced by 20% for storage within the watershed. The test flood inflow was calculated to be 1,060 CSM, equal to 425 CFS and was adopted for this analysis. The routed outflow discharge for the test flood inflow was 390 CFS. The project rating curve and pond storage curve are illustrated in Appendix D. Flood routing was performed assuming a full reservoir at the crest of the overflow structure elevation of 695.0 NGVD.

The analysis indicated that the peak test flood discharge would overtop the dam by approximately 0.4 feet assuming the overflow length of dam to be 250 feet. The peak test flood outflow capacity of the overflow structure and overflow spillway at the top of the dam elevation 697.0 is 200 CFS or 51% of the test flood.

5.5 Dam Failure Analysis

For this analysis a full-depth, partial-width (45.0 feet) breach was assumed to have occurred in this dam. The adopted breach width of 45.0 feet was based on visual inspection of the physical features of the dam. The calculated dam failure discharge of 2,600 CFS assumes the reservoir is full (at top of dam elevation 697.0 feet) just prior to failure, and will produce an approximate water depth of 4.5 feet immediately downstream from the dam and a water depth of 1.4 feet through the first reach. There would be little to no prefailure flooding of this area. The first reach below the dam is a camping area with many campers present during the summer season. There are 15-20 camping spaces located immediately downstream of the dam. This area serves as a storage area for recreational vehicles during the winter season. Dam failure flood stages of 4-5 feet through this reach could possibly cause the loss of more than a few lives and would damage numerous recreational vehicles. Areas below this first reach are heavily wooded and uninhabited with no dam failure impact. The prime impact areas has been estimated, if the dam were to fail, and has been delineated on the Dam Failure Impact Area Map in Appendix D. As a result of the failure analysis, the dam has been classified as a HIGH hazard structure.

SECTION 6

EVALUATION OF STRUCTURAL STABILITY

6.1 Visual Observations

Visual examination of the geotechnical and structural aspects of the dam do not indicate any immediate stability problems. However, the following features could affect the long-term stability of the dam.

a. Based on visual observations made during this inspection, the most critical zone of the dam is at the downstream side where the conduit passes through the dam. The remainder of the dam has flat slopes and a wide crest, but at the location of the conduit the downstream slope is steeper and the condition of the conduit that passes through the dam cannot be observed directly since it has been covered by fill.

   Direct observation of the downstream end of the original conduit should be made to determine whether any seepage is occurring around the outside. Also, the conduit was extended recently by the Owner, and the connection between the old and new conduit may not be sealed. The sections of concrete pipe used for the extension of the conduit also may not be sealed at the joints. These observations should be made and necessary repairs carried out. Then the downstream slope of the dam in the vicinity of the outlet conduit should be cleaned of miscellaneous fill and completed by placement of a properly selected and compacted fill. Erosion protection should be provided in the emergency spillway to withstand the velocity of flood overflows.

6.2 Design and Construction Data

No design or construction drawings or records for the dam are available.

6.3 Post-Construction Changes

There are no post-construction changes made that would adversely affect the stability of this dam, except that the downstream end of the original conduit cannot be observed directly, as described in Section 6.1.

6.4 Seismic Stability

The dam is located in Seismic Zone 1 and, in accordance with recommended Phase 1 guidelines, does not warrant seismic stability analysis.

SECTION 7

ASSESSMENT, RECOMMENDATIONS AND REMEDIAL MEASURES

7.1 Dam Assessment

a. Condition. Based on the visual inspection, this dam appears to be in FAIR condition. Features which could adversely affect the condition of the dam in the future are:

1. Seepage through the dam in the area of the outlet conduit.

b. Adequacy of Information. This Phase 1 inspection was based on the visual inspection and on certain verbal information provided by the present owner regarding the placement of fill on the downstream side and the extension of the conduit.

c. Urgency. The recommendations and remedial measures described below should be implemented by the owner within one year after receipt of the Phase 1 report.

7.2 Recommendations

The following items should be carried out under the direction of a qualified registered engineer and recommendations resulting should be implemented by the owner.

a. Perform a detailed hydrologic-hydraulic investigation to assess further the need for an the means to increase project discharge capacity and the ability of the dam to withstand overtopping.

b. Inspect the downstream end of the original conduit that passes through the dam to determine whether any significant seepage is occurring along the outside of the conduit. Inspect the joint between the old and new conduit and between sections of the new conduit. Make necessary recommendations to prevent piping of fines at these locations.

c. Select a proper fill to complete the downstream face over the conduit. Make recommendations for removal of existing miscellaneous fill, placement procedures for the new fill, and erosion protection of the new slope.

d. Construct a formal spillway discharge channel to carry overflow to the brook downstream.

e. Repair the drop inlet overflow structure to stop the seepage through the walls.

7.3 Remedial Measures

a. Operation and Maintenance Procedures

1. Modify or extend the operating handle to the drawdown gate valve so that it may be operated from above without entering the drop inlet pit.

2. Inspect the downstream slope annually, particularly in the zones where the swamp grass is growing, to ensure that no flowing seepage through the dam is observed.

3. Clear the brush and debris from the emergency overflow spillway.

4. Implement and intensify a program of diligent and periodic maintenance.

5. Establish a protective cover over all bare or disturbed areas.

6. Develop an "Emergency Action Plan" that will include an effective preplanned downstream warning system, locations of emergency equipment, materials and manpower, authorities to contact and potential areas that require evacuation.

7. Provide surveillance during and immediately after high intensity rainfall.

8. Construct a debris collecting structure along the crest of the overflow structure to prevent the outlet from becoming plugged with debris.

7.4 Alternatives

There are no practical alternatives to the recommendations and remedial measures discussed above.

APPENDIX A

INSPECTION CHECKLIST

VISUAL INSPECTION CHECKLIST
PARTY ORGANIZATION

PROJECT NO NAME #42 - CT 584
Beaupres Pond Dam
Pomfret, CT

DATE Dec. 3, 1980

TIME 0800

WEATHER Overcast, 40 degrees

W.S. ELEV. 695.0 U.S 686.2 DN.S.
NGVD

PARTY:

1. David Sluter - New England Engineering
2. Stephen Fodor - New England Engineering
3. Steve Poulos - GEI
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

	PROJECT FEATURE	INSPECTED BY	REMARKS
1.	Hydrology & Hydraulics	D. Sluter	
2.	Civil	S. Fodor	
3.	Geotechnical	S. Poulos	
4.			
5.			
6.			
7.			
8.			
9.			
10.			

2

PERIODIC INSPECTION CHECKLIST

PROJECT NO NAME #42 - BEAUPRE'S POND DAM DATE Dec. 3, 1980

PROJECT FEATURE Dam Embankment NAME Sluter/Fodor

DISCIPLINE Geotechnical/Civil NAME Poulos

AREA EVALUATED	CONDITION
DAM EMBANKMENT	Station 0+00 is at right end of dam.
Crest Elevation	695.0 NGVD
Current Pool Elevation	695.0
Maximum Impoundment to Date	Unknown.
Surface Cracks	None observed.
Pavement Condition	Grassed.
Movement or Settlement of Crest	Irregular, ± 4".
Lateral Movement	None observable
Vertical Alignment	No misalignment observable.
Horizontal Alignment	Not observable. Arched downstream.
Condition at Abutment and at Concrete Structures	Right: satisfactory. Left: runs into emergency spillway. Satisfactory.
Indications of Movement of Structural Items on Slopes	No structures
Trespassing on Slopes	Free access. Used as beach. Bulldozers run on it to clear beach.
Sloughing or Erosion of Slopes or Abutments	Station 1+25 to 1+75 on D/S slope: Misc. trash and steeper slope where conduit outlet formerly terminated. Upstream erosion due to beach activity. Bare spots at several locations.
Rock Slope Protection - Riprap Failures	No riprap along most of beach.
Unusual Movement or Cracking at or Near Toe	None observed.
Unusual Embankment or Downstream Seepage	Station 2+30 D/S along 15' length at downstream toe, grass is swampgrass. Same at Station 2+05 and 1+05 up to half way up slope in all cases. No seepage observed. See checklist for outlet conduit.
Piping or Boils	None observed.
Foundation Drainage Features	None
Toe Drains	None
Instrumentation System	None
Vegetation	Grassed.

PERIODIC INSPECTION CHECKLIST

PROJECT NO NAME #42 - BEAUPRE'S POND DAM DATE Dec. 3, 1980

PROJECT FEATURE Dike Embankment NAME Sluter/Fodor

DISCIPLINE Geotechnical/Civil NAME Poulos

AREA EVALUATED	CONDITION
DIKE EMBANKMENT	No dike present.
Crest Elevation	
Current Pool Elevation	
Maximum Impoundment to Date	
Surface Cracks	
Pavement Condition	
Movement or Settlement of Crest	
Lateral Movement	
Vertical Alignment	
Horizontal Alignment	
Condition at Abutment and at Concrete Structures	
Indications of Movement of Structural Items on Slopes	
Trespassing on Slopes	
Sloughing or Erosion of Slopes or Abutments	
Rock Slope Protection - Riprap Failures	
Unusual Movement or Cracking at or Near Toes	
Unusual Embankment or Downstream Seepage	
Piping or Boils	
Foundation Drainage Features	
Toe Drains	
Instrumentation System	
Vegetation	

PERIODIC INSPECTION CHECKLIST

PROJECT NO NAME #42 - BEAUPRE'S POND DAM DATE Dec. 3, 1980

PROJECT FEATURE Intake Structure NAME Sluter/Fodor

DISCIPLINE Hydraulic/Civil/Geotechnical NAME Poulos

AREA EVALUATED	CONDITION
OUTLET WORKS - INTAKE CHANNEL AND INTAKE STRUCTURE	
a. Approach Channel	
Slope Conditions	N/A
Bottom Conditions	Under water.
Rock Slides or Falls	None.
Log Boom	None.
Debris	N/A.
Condition of Concrete Lining	N/A.
Drains or Weep Holes	N/A.
b. Intake Structure	4' x 4' concrete drop inlet
Condition of Concrete	Construction joint 2' above floor is 1' deep, 1" wide. Seepage at upstream right is 3-5 gpm. Seepage at upstream left is 2-4 gpm.
Stop Logs and Slots	No stop logs or slots.

PERIODIC INSPECTION CHECKLIST

PROJECT NO NAME #42 - BEAUPRE'S POND DAM DATE Dec. 3, 1980

PROJECT FEATURE Control Tower NAME Sluter/Fodor

DISCIPLINE Civil/Geotechnical NAME Poulos

AREA EVALUATED	CONDITION
OUTLET WORKS - CONTROL TOWER	None.
a. Concrete and Structural	
General Condition	
Condition of Joints	
Spalling	
Visible Reinforcing	
Rusting or Staining of Concrete	
Any Seepage or Efflorescence	
Joint Alignment	
Unusual Seepage or Leaks in Gate Chamber	
Cracks	
Rusting or Corrosion of Steel	
b. Mechanical and Electrical	
Air Vents	
Float Wells	
Crane Hoist	
Elevator	
Hydraulic System	
Service Gates	
Emergency Gates	
Lightning Protection System	
Emergency Power System	
Wiring and Lighting System	

PERIODIC INSPECTION CHECKLIST

PROJECT NO NAME #42 - BEAUPRE'S POND DAM DATE Dec. 3, 1980

PROJECT FEATURE Outlet Conduit NAME Sluter/Fodor

DISCIPLINE Civil/Geotechnical NAME Poulos

AREA EVALUATED	CONDITION
OUTLET WORKS - TRANSITION AND CONDUIT	2' x 2' box culvert.
General Condition of Concrete	Fair to poor
Rust or Staining on Concrete	Staining and efflorescence on upstream end. Entire inside perimeter is wet but no flowing water observed. Seems to be more water exiting from downstream end of culvert than coming in through intake structure.
Spalling	Not observable.
Erosion or Cavitation	None observed.
Cracking	Not observable.
Alignment of Monoliths	Not observable.
Alignment of Joints	Not observable.
Numbering of Monoliths	

PERIODIC INSPECTION CHECKLIST

PROJECT NO NAME #42 - BEAUPRE'S POND DAM DATE Dec. 3, 1980

PROJECT FEATURE Outlet Works NAME Sluter/Fodor

DISCIPLINE Civil/Geotechnical NAME Poulos

AREA EVALUATED	CONDITION
OUTLET WORKS - OUTLET STRUCTURE AND OUTLET CHANNEL	Outlet of 2' x 2' box culvert has been extended with 30" diameter concrete pipe. Could not inspect that transition as it has been buried.
General Condition of Concrete	
Rust or Staining	
Spalling	
Erosion or Cavitation	
Visible Reinforcing	
Any Seepage or Efflorescence	
Condition at Joints	
Drain holes	
Channel	
Loose Rock or Trees Overhanging Channel	Small trees to 6" in size overhanging. Vegetation: cattails in channel.
Condition of Discharge Channel	Fair to poor.

PERIODIC INSPECTION CHECKLIST

PROJECT NO NAME #42 - BEAUPRE'S POND DAM DATE Dec. 3, 1980

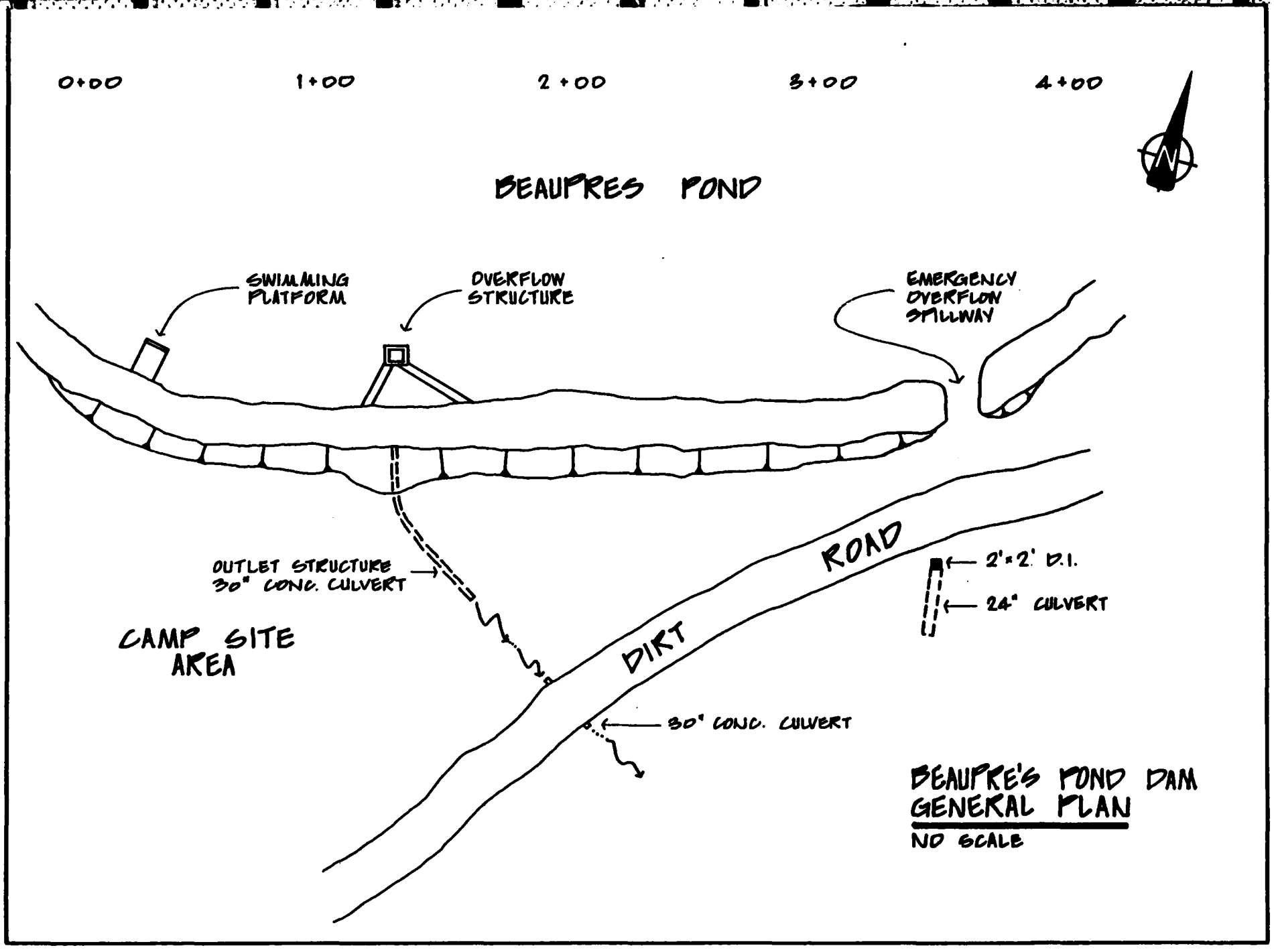
PROJECT FEATURE Overflow Spillway NAME Sluter/Fodor

DISCIPLINE Hydraulic/Civil/Geotechnical NAME Poulos

AREA EVALUATED	CONDITION
OUTLET WORKS - SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS	
a. Approach Channel	
General Condition	Poor.
Loose Rock Overhanging Channel	None.
Trees Overhanging Channel	Trees on left side of approach to 6" size.
Floor of Approach Channel	Large boulders, heavy vegetation, brush, debris, logs.
b. Weir and Training Walls	
General Condition of Concrete	
Rust or Staining	
Spalling	The spillway is an earth cut. The weir is full of vegetation debris and logs.
Any Visible Reinforcing	
Any Seepage or Efflorescence	
Drain Holes	
c. Discharge Channel	Obstructed by road of bank run gravel over a culvert which is a concrete pipe 2' dia.
General Condition	
Loose Rock Overhanging Channel	None.
Trees Overhanging Channel	Fully forested on downstream side of above culvert. Sand has been washed in at downstream end of culvert.
Floor of Channel	Trees and boulders downstream of culvert discharge, which is about 100' downstream from dam centerline.
Other Obstructions	Culvert would not limit high flows through emergency spillway. Flow would wash over the road.
Other Comments	

APPENDIX B

ENGINEERING DATA


0+00
1+00
2+00
3+00
4+00
N
BEAUPRES POND
SWIMMING PLATFORM
OVERFLOW STRUCTURE
EMERGENCY OVERFLOW SPILLWAY
OUTLET STRUCTURE 30" CONC. CULVERT
CAMP SITE AREA
DIRT ROAD
2'×2' D.I.
24" CULVERT
30" CONC. CULVERT
BEAUPRE'S POND DAM
GENERAL PLAN
NO SCALE

A

CT584

STATE BOARD FOR THE SUPERVISION OF DAMS
INVENTORY DATA

Name of Dam or Pond: 10 Beaupres Dam MN42

Code No.: Q 32.1 MS 7.3 LY 1.8 U 0.3

Location of Structure

LAT. 41°51.8'

LONG. 72°02.6'

Town: Pomfret

Name of Stream: Lyon

U.S.G.S. Quad.: Hampton

Owner: Beaupres [illegible]

Address: Pomfret Route 44

Pond Used For: Recreation

DA 0.35 SM

Dimensions of Pond: Width ______ Length ______ Area 5 A

Total Length of Dam: 225'

Length of Spillway: 30'

Depth of Water Below Spillway Level (Downstream): 12' [illegible]

Height of Abutments Above Spillway: 2'

Type of Spillway Construction: [illegible]

Type of Dike Construction: Fill

Downstream Conditions: Woods [illegible]

Summary of File Data

Remarks: drop inlet [illegible] emergency [illegible] 3-26-74

1955

APPENDIX C

PHOTOGRAPHS

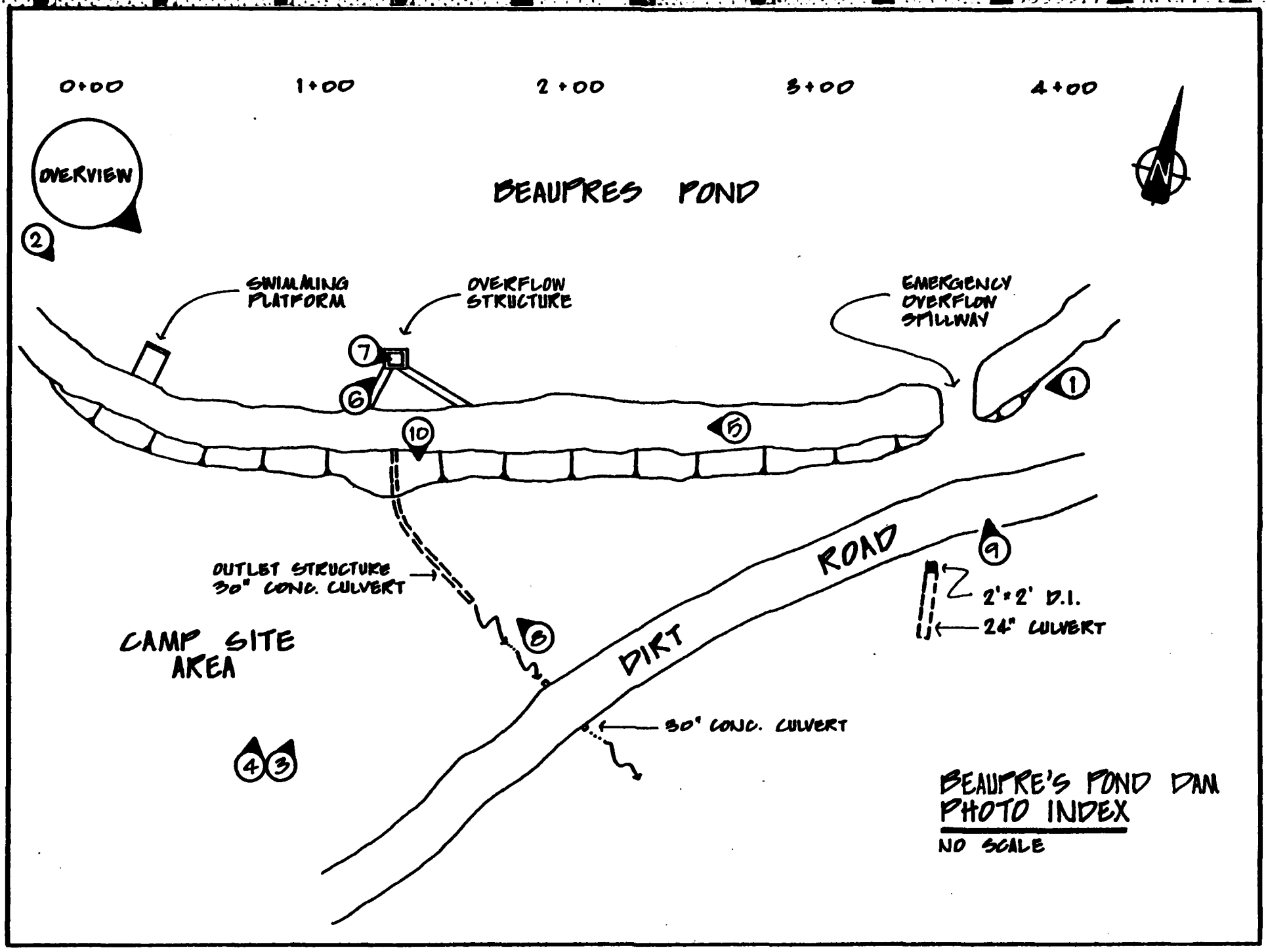

0+00
1+00
2+00
3+00
4+00
OVERVIEW
BEAUPRES POND
SWIMMING PLATFORM
OVERFLOW STRUCTURE
EMERGENCY OVERFLOW SPILLWAY
OUTLET STRUCTURE 30" CONC. CULVERT
CAMP SITE AREA
ROAD
DIRT
2'x2' D.I.
24" CULVERT
30" CONC. CULVERT
BEAUPRE'S POND DAM
PHOTO INDEX
NO SCALE

PHOTO C-1: Crest and upstream face from left side. Brushy area in foreground is the emergency overflow spillway.

PHOTO C-2: Upstream face from right side.

PHOTO C-5: Close up of crest and upstream face. Note erosion and lack of riprap.

PHOTO C-6: Drop inlet for outlet works at end of dock.

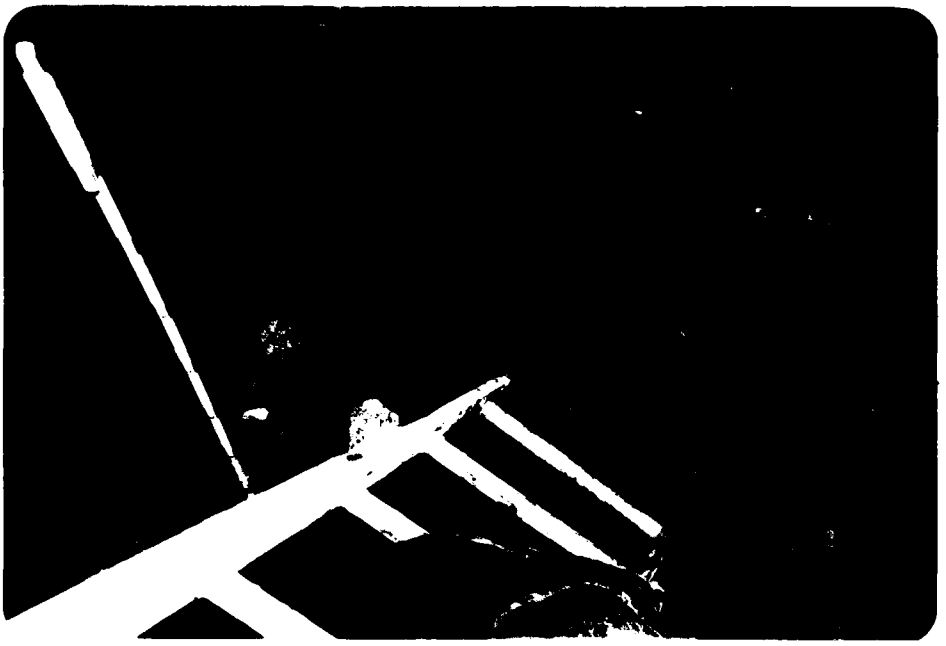


PHOTO C-7: Inside the drop inlet structure - 2' x 2' box culvert outlet. 6" gate valve to draw down pond is under the ladder.

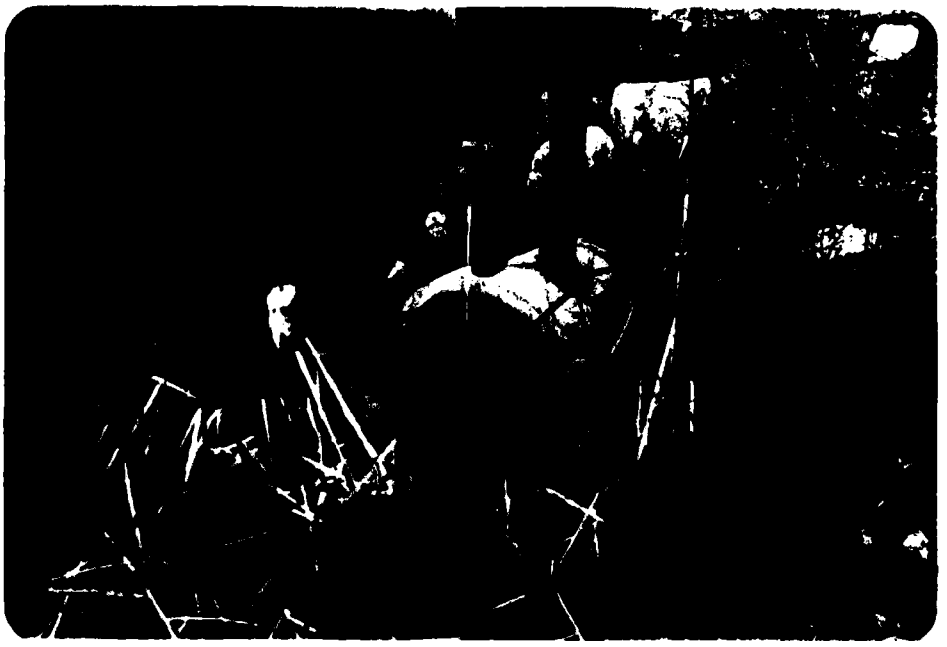


PHOTO C-8: 30" diameter extension of the outlet conduit with seepage on left side.

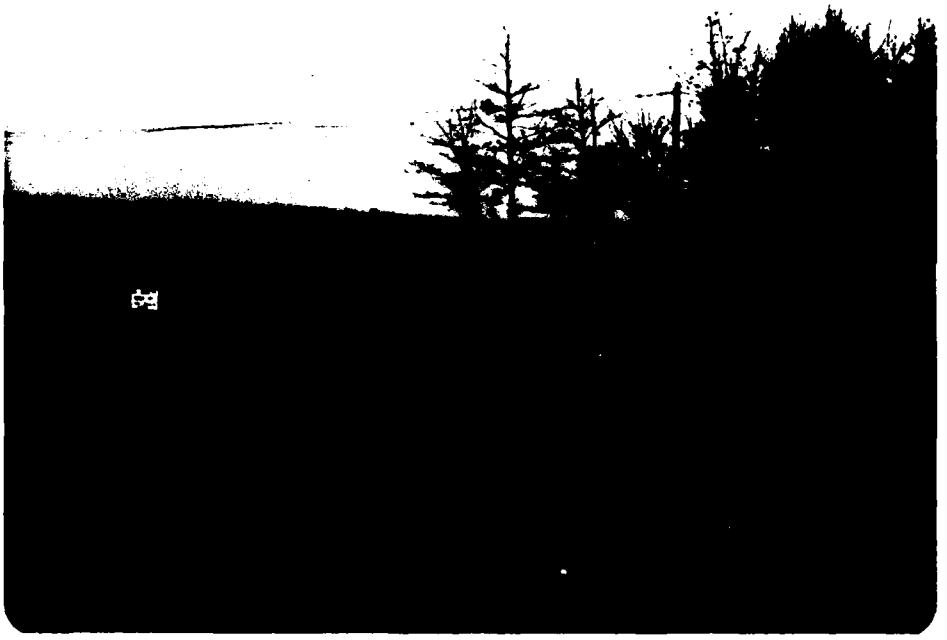
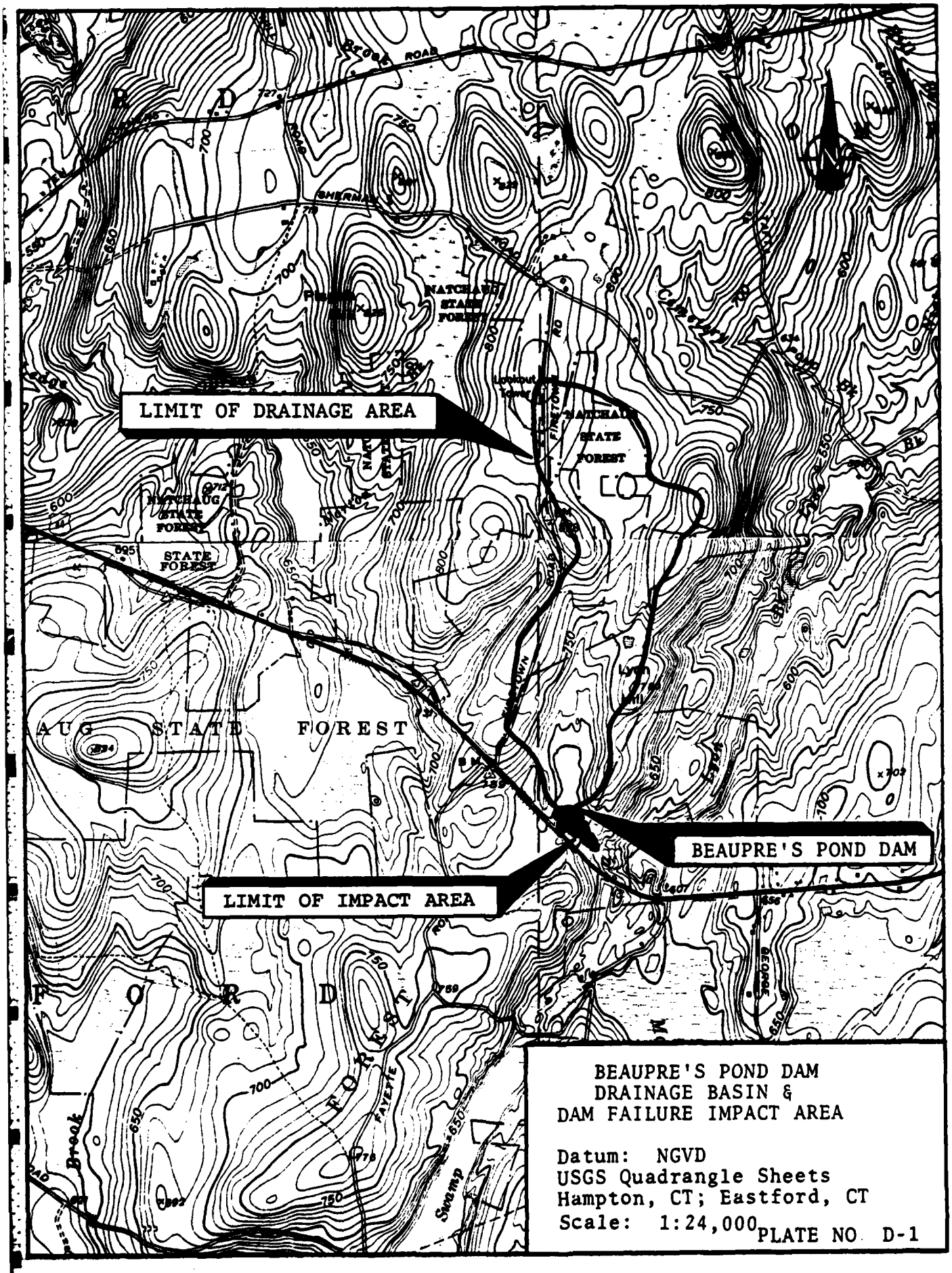


PHOTO C-9: Emergency overflow spillway.

PHOTO C-10: Discharge channel looking downstream.

APPENDIX D

HYDROLOGIC & HYDRAULIC COMPUTATIONS



BEAUPRE'S POND DAM
DRAINAGE BASIN &
DAM FAILURE IMPACT AREA

Datum: NGVD
USGS Quadrangle Sheets
Hampton, CT; Eastford, CT
Scale: 1:24,000

PLATE NO D-1

NO NAME # 42

BASIC DATA

DRAINAGE AREA = 0.40 SQ. MILES
NORMAL POOL ELEV. = 695.0
MAX POOL ELEV. = 697.0

RESERVOIR:

@ NORMAL POOL (695.0) AREA: 8 AC. STOR = 50 AC-FT

@ MAX POOL (697.0) AREA: 8.5 AC STOR = 66 AC-FT

@ TEST FLOOD POOL (697.4) AREA = 8.7 AC STOR = 69 AC-FT

DAM: EARTH FILL
MAX. HEIGHT = 12 FT.
LENGTH = 380 FT.

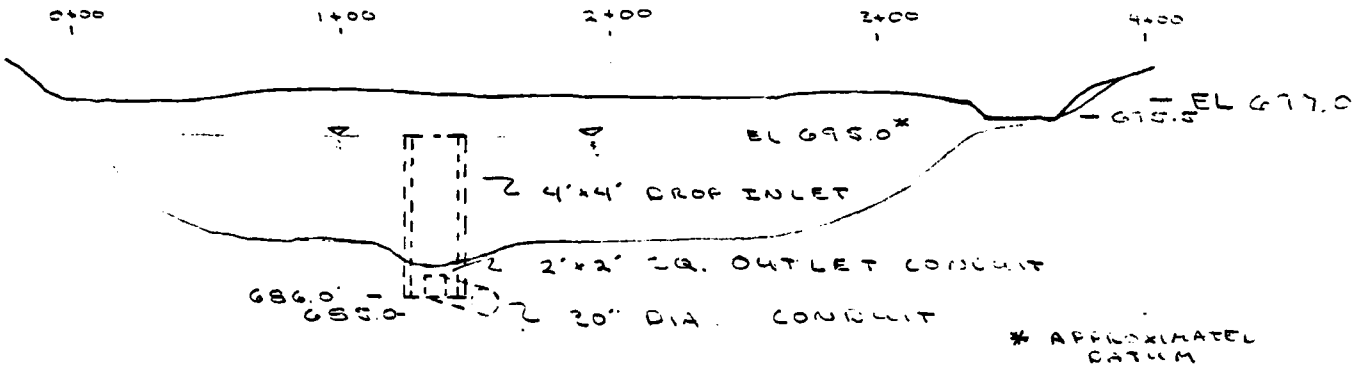
SPILLWAY: EARTH OVERFLOW CHANNEL AT END OF DAM ELEV = 695.5

OUTLETS

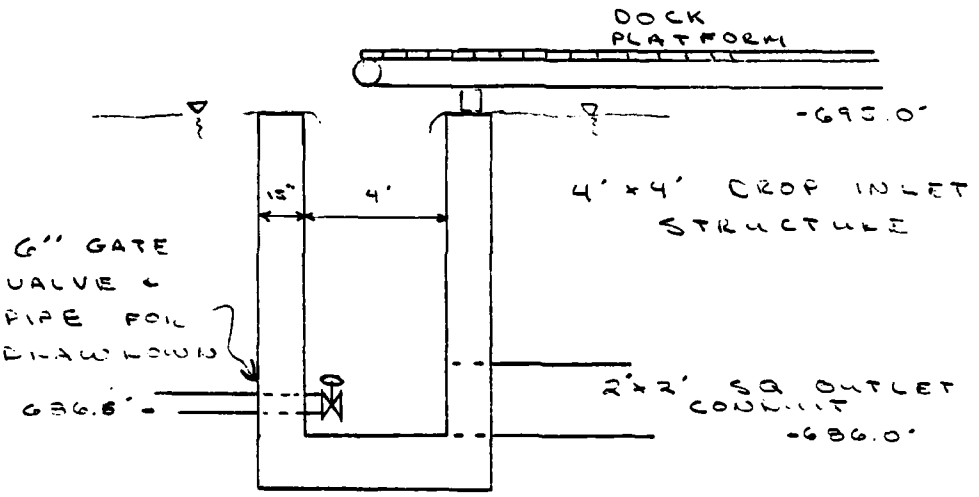
MAIN OUTLET STRUCTURE: 4'x4' DROP INLET
ELEV = 693.0' (APPROXIMATED DATUM)
= CONTROL ELEVATION FOR POND

DROP INLET STRUCTURE OUTLET: THRU 2'x2' BOX CULVERT @ INV. EL. = 686.0 FT

DRAWDOWN OUTLET: 6" CI. PIPE AND GATE VALVE TO INSIDE OF D.I. STRUCTURE @ INV. EL. = 686.6 FT

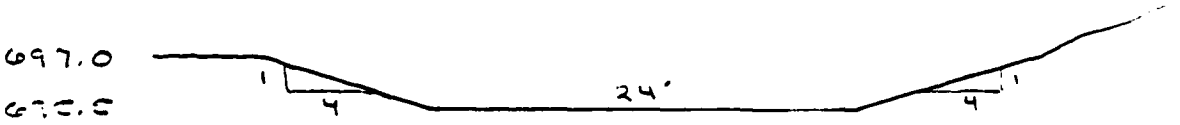


SECTION ALONG DAM LOOKING UPSTREAM



OUTLET STRUCTURE DETAIL

(EARTH CHANNEL)



OVERFLOW CHANNEL

CALCULATE TEST FLOOD

CLASSIFICATION:
SIZE: SMALL
HAZARDS: HIGH

USE 1/2 PMF AS TEST FLOOD

FROM COE PMF CURVES EXTENDED FOR THIS SMALL DRAINAGE AREA FOR ROLLING TOPOGRAPHY

PMF = 2650 CSM

1/2 PMF = 1325 CSM

REDUCE TEST FLOOD BY 20% FOR NATURAL RAIN STORAGE

.8 × 1325 = 1060 CSM

TEST FLOOD = .4 SQMI × 1060 CSM

= 425 CFS.

CALCULATE DAM RATING CURVE

CREST: WEIR LENGTH 12' WHEN SUBSTRACTING FOR DOCK SUPPORT & CORNERS

$Q = CLH^{3/2}$ $C = 3.6$

H =	.2(ft)	.4	.5	.6	.8	1.0	1.2	1.4
Q =	4(cfs)	11	15	20	31	43	57	72

CHECK CULVERT CAPACITY

$Q = CA\sqrt{2gh}$ $C = .6$ $A = 4^{0}$
h = ∆ FROM ∆

h =	1'(FT)	1.5	2.0	5.0	8.0	10 (TOP)	11	12
Q =	19 (cfs)	24	27	43	54	61	64	67

OVERFLOW CHANNEL CAPACITY

USE $Q = C L H^{3/2}$ $C = 2.4$

L VARIES

				(TOO)		
H =	0.2'	.5	1.0	1.5	2.0	1.7
L =	24'	26	28	30	32	32
Q =	5 cfs	22	67	132	217	201

EMBANKMENT

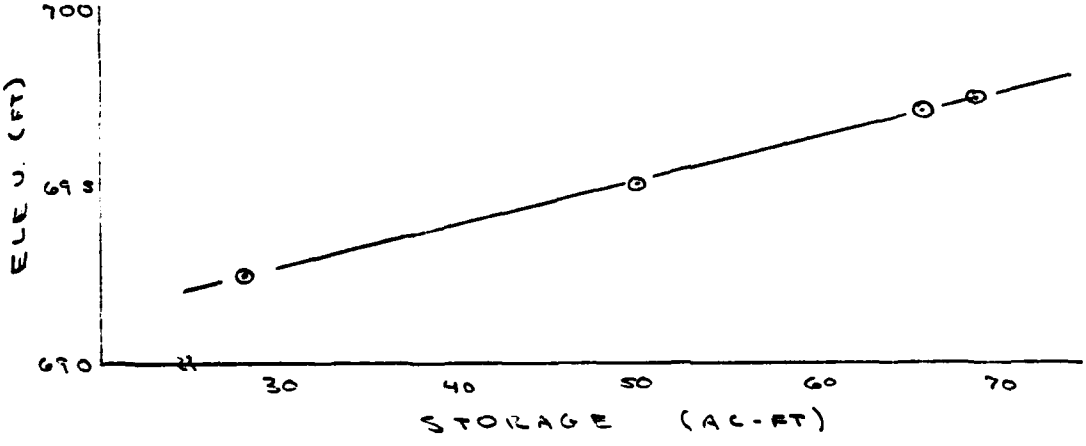
USE $Q = CLH^{3/2}$ $C = 2.4$ $L = 250'$

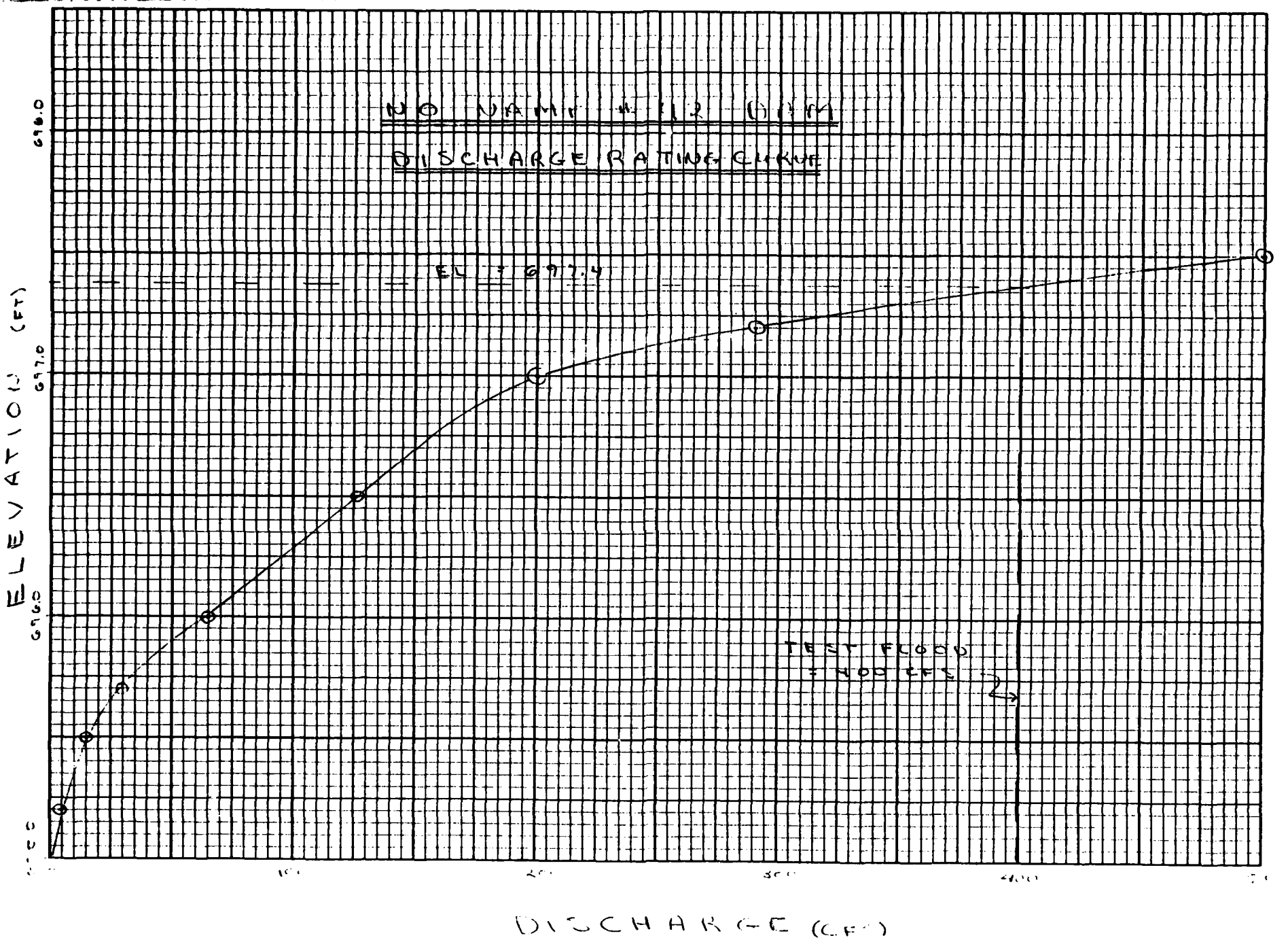
L = 250' CHOSEN AS TOP OF DAM IS IRREGULAR

TOTAL PROJECT DISCHARGE

W.S. EL	HOUT	QOUT	HOVER	QOVER	HDAM	QDAM	Q TOTAL
695.0	-						0 CFS.
695.2	0.2'	4	-	-	-	-	4
695.4	0.4	11	-	-	-	-	11
695.5	0.5	15	-	-	-	-	15
695.7	0.7	25	0.2	5	-	-	30
696.0	1.0	43	0.5	22	-	-	65
696.5	9.5*	59	1.0	67	-	-	126
697.0	10.0	65	1.5	135	-	-	200
697.2	10.2	65	1.7	170	0.2	55	290
697.5	10.5	65	2.0	220	0.5	215	500

STORAGE CURVE




NO NAME # 112 (CFM)
DISCHARGE RATING CURVE
EL = 697.4
TEST FLOOD
= 1100 CFS
ELEVATION (FT)
698.0
697.0
696.0
DISCHARGE (CFS)

SHT 5 OF 8

CALCULATE EFFECT OF SURCHARGE STORAGE

PEAK INFLOW = 425 CFS SURCHARGE = 2.4'

SURCHARGE VOLUME = 67 - 50 = 17 AC-FT

$$STOR_1 = \frac{19 \text{ AC-FT} \times 12 \text{ IN/FT}}{0.4 \text{ SQ.MI.} \times 640 \text{ AC/SQ.MI.}} = 0.9 \text{ IN}$$

$$QP_2 = 425\left(1 - \frac{0.9}{9.5}\right) = 384 \text{ CFS}$$

SURCHARGE @ 384 CFS = 2.35' U = 18.6

$$STOR_2 = \frac{18.6 \text{ AC-FT} \times 12}{0.4 \times 640} = 0.9 \text{ IN}$$

$STOR_1 = STOR_2 - STOR_{ADJ} = ?$

$\therefore QP_3 = QP_2 = 400$ C.F.S.

1. STORAGE WILL REDUCE THE TEST FLOOD BY 25 CFS OR 6%
2. THE OUTLET STRUCTURE AND OVERFLOW CHANNEL CAN PASS 193 CFS OR 50% OF THE TEST FLOOD DISCHARGE
3. AT THE TEST FLOOD DISCHARGE OF 383 CFS THE DAM WILL BE OVERTOPPED BY 0.35 FT.

DAM FAILURE ANALYSIS

DAM FAILURE DISCHARGE CALCULATED ACCORDING TO CORPS OF ENGINEERS GUIDE LINES

$$Q_{FAIL} = 8/27 \; W_b \sqrt{g} \; Y_o^{3/2}$$

W_b = BREACH WIDTH = 45 FT (ASSUMED)
Y_o = TOTAL HEIGTH = 10 FT

$$Q_{FAIL} = 8/27 \; (45) \sqrt{32.2} \; (10^{3/2})$$

$$= 2393 \text{ CFS}$$

TOTAL FLOW = Q_F 2393
Q_{PF} + 193
Q_T = 2586 CFS

DOWN STREAM IMPACT

1ST REACH 800 FT LONG AVG 300 FT WIDE
SLOPE = 40'/700' = .057 n = 0.05
TREAT AS WIDE CHANNEL R = Y

$$Q = \frac{1.49}{n} B Y^{3/2} S^{1/2}$$

$$Y = \left(\frac{Q}{B} \left(\frac{n}{1.49} \right) \frac{1}{S^{1/2}} \right)^{3/2}$$

$$= \left(\frac{2586}{300} \left(\frac{.05}{1.49} \right) \frac{1}{.057^{1/2}} \right)^{3/2}$$

$$= \left(8.6 \times .034 \times 4.19 \right)^{3/2}$$

$$= 1.4 \text{ FEET}$$

MAX FLOW DEPTH = 4/7 Y_o = 4.3 FT

IMPACT SUMMARY

A DAM FAILURE AND SUBSEQUENT DISCHARGE OF 2400 CFS ± WOULD CAUSE FLOODING OF 4.5 TO 1.4 FEET THROUGH THE CAMPING AREA JUST BELOW THE DAM. THIS COULD CAUSE THE LOSS OF LESS THAN A FEW LIVES AND WOULD DAMAGE THE NUMEROUS CAMPING TRAILERS, ETC. IN THIS AREA. DURING THE WINTER SEASON THERE ARE NO DOWNSTREAM INHABITANTS BUT 10 TO 12 TRAVEL TRAILERS STAY STORED IN THE HAZARD AREA.

BEYOND THE CAMPING AREA, DOWNSTREAM REACHES ARE UNINHABITATED WOODLANDS AND NO HAZARD EXISTS.

APPENDIX E

INFORMATION AS CONTAINED IN THE NATIONAL INVENTORY OF DAMS

END

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